

ACCESSION NR: AP4037177

S/0069/64/026/003/0324/0329

AUTHOR: Kiselev, A. V.; Ly*gin, V. I.; Solomonova, I. N.

TITLE: Infrared study of chemically modified aerosil

SOURCE: Kolloidny*y zhurnal, v. 26, no. 3, 1964, 324-329

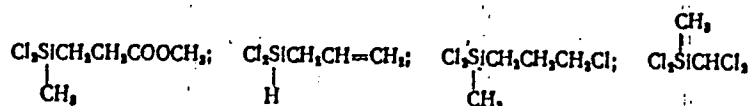
TOPIC TAGS: aerosil, modified aerosil, aerosil adsorbent, gas chromatography, infrared aerosil spectrum, substituted dichlorosilane, surface active ester, radical heat resistance, hydroxy group, aerosil adsorptive property, deuterium treatment, chlorine containing group, allyl radical

ABSTRACT: The work concerns aerosils treated with surface-active esters, allyl and chlorine-containing functional groups, for use as adsorbents and carriers for gas chromatography or fillers and pigments for polymers. The aerosil used (made by Degus) had a surface of 170 m²/g. Substituted dichlorosilanes with carbon chains of various length and functional endgroups were used as modifiers in a dioxane medium.

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The laboratory procedure is described. The extent of substitution of surface hydroxyl groups by organic radicals was found at less than 50% (C determination by wet combustion). The material obtained was pressed into tablets for infrared inspection. The spectra were obtained and it was concluded that mainly free surface hydroxyl groups participated in the modification reaction; the functional ester and chlorine-containing groups surface radicals are hydrogen-bonded to the remaining surface hydroxyls; and the most heat-resistant radicals were those with ester and chlorine-containing groups, allyl was less heat resistant. At the low experimental density of the modifying layer, the remaining hydroxyl groups determined essentially the adsorptive properties of the modified aerosils. Treatment with deuterium and methylation of the latter's surface revealed availability of part of the surface hydroxyls for small molecules and another part for large molecules, such as diethyl ether. For gas chromatography denser layers should be

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obtained. "The authors wish to thank K. D. Sheherbakov and I. V. Borisenko for their help in modifying the specimens and in their analysis." Orig. art. has: 4 formulas and 1 figure.

ASSOCIATION: Moskovskiy universitet im. M. V. Lomonosova, Khimicheskiy fakul'tet (Moscow University, Chemistry Faculty)

SUBMITTED: 24Jul63

ENCL: 00

SUB CODE: GC

NO REF SOV: 011

OTHER: 005

3/3

Card

KISELEV, A.V.; KOZLOV, G.A.; LYGIN, V.I.

Electron paramagnetic resonance spectra of graphitized carbon blacks. Koll. zhur. 26 no.5:651-653 S-O '64.

(MIRA 17:10)

1. Moskovskiy universitet imeni Lomonosova, khimicheskiy fakul'tet.

ACCESSION NR: AP4034593

S/0076/64/038/004/1044/1047

AUTHOR: Abramov, V. N.; Kiselev, A. V.; Ly*gin, V. I.

TITLE: Infrared study of the adsorption of phenol, aniline and nitrobenzene on Aerosil and zeolite.

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 4, 1964, 1044-1047

TOPIC TAGS: infrared spectroscopy, adsorption, phenol, aniline, nitrobenzene, Aerosil, zeolite, molecular spectra

ABSTRACT: In this work a study was made of the change of the infrared spectrum of the hydroxyl groups on the surface of Aerosil, during the adsorption of phenol, aniline and nitrobenzene, as well as the IR spectra of these molecules themselves, upon the adsorption on Aerosil and zeolite. Fig. 1 shows the spectrum of Aerosil, evacuated at 400 C and the spectra after adsorption of phenol, aniline and nitrobenzene under saturated vapor pressure of these compounds at 25 C. Due to the overlap of absorption bands of the associated surface and intraglobular hydroxyl groups of Aerosil and phenol it is difficult to establish accurately the magnitude of the shift of the groups of Aerosil with respect to the absorption band of free

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hydroxyl groups perturbed by adsorption of phenol hydroxyl. The magnitude of shift during adsorption of phenol is not more than 350 cm^{-1} . During adsorption of aniline the band lies around 3200 cm^{-1} and the shift is $\sim 550\text{ cm}^{-1}$. During adsorption of nitrobenzene the band of perturbed free hydroxyl groups on the surface of Aerosil is completely masked. Therefore, one can only say that the shift is much less during adsorption of nitrobenzene than during adsorption of phenol and aniline ($\sim 150\text{ cm}^{-1}$). The changes of IR spectra of the adsorbed molecules themselves are also shown in Fig. 1. The greatest changes are observed in the vibrational frequency of OH in the phenol and NH in the aniline. In the case of nitrobenzene no significant changes are observed. Changes of molecular spectra during the adsorption on zeolite are greater than during the adsorption on Aerosil. Orig. art. has: 1 table and 2 figures.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova, Khimicheskii facul'tat (Moscow State University im. M. V. Lomonosov, Chemistry Department)

SUBMITTED: 05Nov63

ENCL: 01

Card 2/4

ACCESSION NR: AP4034593

SUB CODE: GC

NO REF SOV: 012

OTHER: 006

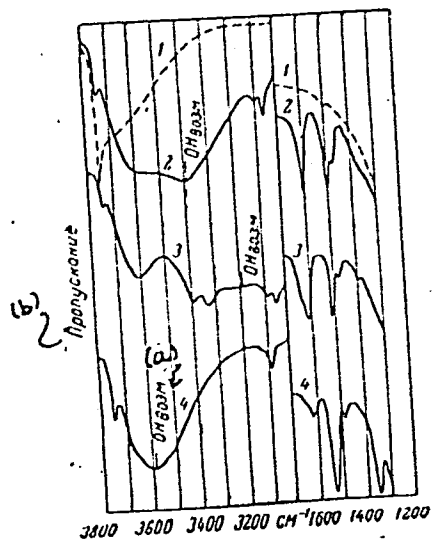
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ENCLOSURE: 01

ACCESSION NR: AP4034593

Fig. 1. Infrared spectrum of Aerosil

- 1) pumped down at 400 C
after adsorption
- 2) phenol
- 3) aniline
- 4) nitrobenzene
- a) OH excited
- b) transmission



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L 23055-65 EWT(m)/T

ACCESSION NR: AP4047981

13 S/0076/64/038/010/2408/2414
B

AUTHOR: Zhdanov, S. P. (Moscow); Kiselev, A. (Moscow); Lygin, V. I. (Moscow);
Titova, T. I. (Moscow)

TITLE: Infrared spectra of synthetic faujesites of varying composition and of their adsorbed water

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 10, 1964, 2408-2414

TOPIC TAGS: synthetic faujesite, infrared spectrum, faujesite type zeolite

ABSTRACT: The IR spectra of synthetic faujesite-type zeolites of different composition and with different cations, and of zeolites containing adsorbed water which was desorbed from the channels in the crystal under different conditions were investigated. Sodium faujesites with Si:Al ratio varied from 1.2 to 2.5 and faujesites in which the Na was extensively replaced by Ca or Sr were prepared. The Al-O bond frequencies in the tetrahedral framework were very sensitive to the species of the compensating cation. The faujesites with a high Al content, i. e. with the greatest concentration of exchange cations, displayed several differ-

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L 23055-65

ACCESSION NR: AP4047981

ent states of the OH groups of the adsorbed water molecules: two of these states were energetically near (one was characterized as the formation of a strong hydrogen bond, and the other was a strong bond with the zeolite skeleton), and a third state was due to the OH group of the water molecule interacting with the faujesite cations. The radius and polarizability of the cations affected the extent to which the OH groups were perturbed. These differences were less in zeolites containing less Al, and the bonds between the adsorbed molecules and the zeolite surface were weaker. "The authors thank N. N. Buntar for participation in the synthesis of the samples and Ye. N. Yegorov for conducting the chemical analysis." Orig. art. has: 6 figures, 2 tables and 2 formulae

ASSOCIATION: Akademiya nauk SSSR, Institut khimii silikatov (Academy of Sciences SSSR, Institute of Silicate Chemistry); Khimicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova (Chemistry Department, Moscow State University)

SUBMITTED: 09Dec63

ENCL: 00

SUB CODE: MT, OP

NO REF SOV: 010

OTHER: 012

Card 2/2

KISELEV, A.V.; KUBELKOVA, L.; LYGIN, V.I.

Study of the adsorption of methanol by synthetic faujasites by
the method of infrared spectroscopy. Zhur.fiz.khim. 38 no.11:
2719-2725 N '64. (MIRA 18:2)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova,
khimicheskiy fakul'tet.

KISELEV, A.V.; LYGIN, V.I.; TITOVA, T.I.

Specific adsorption of ammonia on silica and zeolite studied by
infrared spectroscopy. Zhur.fiz.khim. 38 no.11:2730-2733 N '64.
(MIRA 18:2)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova,
khimicheskii fakul'tet.

GALKIN, G.A.; KISELEV, A.V.; LYGIN, V.I.

Variations in the infrared spectrum of benzene adsorbed on aerosil
as a function of coverage and dehydration of the surface. *Kin.i*
kat. 5 no.6:1040-1048 N-D '64. (MIRA 18:3)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova,
khimicheskiy fakul'tet i Institut fizicheskoy khimii AN SSSR.

L 54777-55

EPA(s)-2/ENT(D)/EPE(c)/EPR/EPF(j)/T1 Pc-4/Pr-4/PS-4/Pt-7 W/R/RM

ACCESSION NR: /AP5014521

UR/0069/65/027/003/0320/0325
541.183

AUTHOR: Borisova, F. K.; Galkin, G. A.; Kiselev, A. V.; Korolev, A. Ya.; Lygin,
V. I.

TITLE: Infrared study of the nature of the active adhesion layer on the surface
of polytetrafluoroethylene

SOURCE: Kolloidnyy zhurnal, v. 27, no. 3, 1965, 323-325

TOPIC TAGS: polytetrafluoroethylene, surface property, surface treatment, polymer,
fluoropolymer, ir spectrum

ABSTRACT: The IR spectra of surface compounds based on polytetrafluoroethylene
modified by different methods were studied using polymer films. Modification of
the film by three different methods (in sodium naphthalene complex, in liquid am-
monia solution of metallic sodium and in molten potassium acetate) produced hydro-
phobization of the surface and improved the adhesive properties of the polymer. In-
frared spectra were studied in surface compounds based on multilayer polymer films
before and after modification. Conjugated double bonds were found in the surface

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L 54777-65

ACCESSION NR: AP5014521

layers of films modified by all three treatments, yet each of the methods of modification leads to the formation of different new functional groups (CO, OH, CH₂, CH₃, NH₂). The carbonyl and hydroxyl surface groups are thermally less stable than CH₂ and CH₃ groups. The conjugated double bonds on modified film surfaces are not destroyed by heating in a vacuum up to 300°C. Orig. art. has: 1 table and 4 figures.

ASSOCIATION: none

SUBMITTED: 09Dec53

ENCL: 00

SUB CODE: 00

NO REF EOV: 009

OTHER: 014

Card 2/2

ABRAMOV, V.N.; KISELEV, A.V.; LYGIN, V.I. (Moskva)

Vibrational spectra and state of water molecules adsorbed on
synthetic zeolites. Zhur. fiz. khim. 39 no. 1:123-128 Ja '65
(MIRA 19:1)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova,
khimicheskoy fakul'tet. Submitted May 19, 1964.

KISELEV, A.V.; KOZLOV, G.A.; LYGIN, V.I.

Electron paramagnetic resonance of modified Ukhta channel blacks.
Zhur. fiz. khim. 39 no.5:1256-1263 My '65. (MIRA 18:8)

1. Khimicheskiy fakul'tet Moskovskogo gosudarstvennogo
universiteta imeni M.V. Lomonosova.

GALKIN, G.A.; KISELEV, A.V.; LYGIN, V.I.

Infrared spectra and energy of interaction in the adsorption
of aromatic compounds on aerosil. Kin. i kat. 5 no.5:935-
938 S-O '64. (MIRA 17:12)

1. Institut fizicheskoy khimii AN SSSR i Moskovskiy gosudarstvennyy
universitet imeni Lomonosova, khimicheskiy fakul'tet.

ABRAMOV, V.N.; KISILEV, A.V.; LYGIN, V.I.

Analysis of the vibrational spectrum of adsorbed ammonia.
Zhur. fiz. khim. 38 no.7:1867-1870 J1 '64.

§(MIRA 18:3)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova,
khimicheskiy fakul'tet.

ZHDANOV, S.P.; KISELEV, A.V.; LYGIN, V.I.; OVSEPYAN, M.Ye.; TITOVA, T.I.

Infrared spectra of synthetic zeolites type NaA, NaX, NH₄X and
their decationized forms. Zhur.fiz.khim. 39 no.10:2453-2458 0
'65. (MIRA 18:12)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova,
khimicheskoy fakul'tet i Institut khimii silikatov AN SSSR.
Submitted July 6, 1964.

PODOLYEV, I.V.; ROZLOV, G.A.; LYGIN, V.I.

Infrared and electron paramagnetic resonance spectra of channel blocks. Zhur.fiz.khim. 39 no.11:2772-2778 N 165.

(MIRA 18:12)

I. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.

ACC NR: AP6031651

SOURCE CODE: UR/0020/66/170/001/0139/0142

AUTHOR: Zubov, P. I.; Kiselev, A. V. ; Krylova, L. M.; Sukhareva, L. A.; Lygin, V. I.

ORG: Institute of Physical Chemistry, Academy of Sciences, SSSR (Institut fizicheskoy khimii Akademii nauk SSSR); Moscow State University im. M. V. Lomoso (Moskovskiy gosudarstvennyy universitet)

TITLE: Effect of molecular interaction between polymers and solids in the mechanical properties of polymer coatings

SOURCE: AN SSSR. Doklady, v. 170, no. 1, 1966, 139-142

TOPIC TAGS: polymer coating, molecular interaction, ~~polymer coating~~, internal stress, ~~coating~~ strength, ~~coating~~ adhesion, *plastic coating, polyester resin, alkyl resin, plastic filler, mechanical property*

ABSTRACT: A study has been made of the interaction of polymer functional groups with filler surfaces, and of the effect of this interaction on the internal stresses, strength, and adhesion of polymer coatings. The experiments were conducted with PN-1 polyester resin or FL-50 akyl resin, and aerosil filler, both nonmodified or modified with actadecylamine. The interaction was studied by IR spectroscopy. The results of the experiments given in graphic form indicated that the mechanical properties of polymer coatings are highly dependent on the nature of the molecular interaction between polymers and solids. Orig. art. has: 4 figures.

SUB CODE: 11, 20/ SUBM DATE: 07Dec65/ ORIG REF: 008/ OTH REF: 001

Card 1/1

UDC: 541.68

EYDEL'SHTEYN, I.A.; LYGIN, V.V.

Investigating operating conditions of the Pk-4 and PK-5 cutter loaders. Nauch. trudy KNIUI no.13:213-219 '64

Results of testing the PK-4 and Pk-5 minig cutter-loaders in the Karaganda Basin. Ibid.:219-226

LYGINA, I. A.

Heat of adsorption of benzene vapors on carbons, thermodynamics and adsorption forces. N. N. Avgul, G. I. Berzin, A. V. Kiselev, and I. A. Lygina. *Izv. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1959, 1804-11; cf. C.A. 51, 6328f. The heats of adsorption and the adsorption isotherms were detd. for C_6H_6 adsorbed on samples of C described previously (*loc. cit.*). The change in the free energy, total energy, and entropy of adsorption with change in the degree of covering of the surface were detd. For C_6H_6 covering half the surface the following values were detd.: $\Delta U^\circ = -1.85$, $\Delta F^\circ = -2.40$ kcal./mole and $\Delta S^\circ = +1.9$ cal./mole degree. A theoretical calca. for energy of adsorption agrees closely with the measured values.

I. Rostar Leach

Ind. Phys-Chem AS USSR

LYGINA, I. A.

Heat of adsorption of hexane vapors upon carbon black. Thermodynamics and adsorption forces. N. N. Avdeyev, A. V. Kiselev, and I. A. Lygina (Phys. Chem. Int. Acad. Sci., U.S.S.R., Moscow, 1968, 44, 2106-2111, 1968). — Two kinds of C black were used in the tests: A "channel black", kept for 12 hrs. in a vacuum at 600°, with the surface coated with C oxides; and the same black after graphitizing in H₂ at 1700° for 1.5 hrs. The differential heat of adsorption on these samples and the n-C₆H₁₄ vapor adsorption isotherm were detd. with an automatic recording calorimeter with const. heat exchange in the adsorption app. The graphitization treatment made the surface more uniform and increased the adsorption and the heat of adsorption of hexane. The max. adsorption was obtained when a unimol. layer is filled on a

change in the adsorption ... and increased the ad-
sorption and the heat of adsorption of hexane. The max-
imum adsorption is reached when a unimol. layer is filled on a
uniform surface, when the abs. vapor adsorption is ex-
pressed by the Langmuir adsorption isotherm, whereas in a
multimol. range it conforms to the B.E.T. equation. The
relation between the free and the total energy, and the vapor
adsorption theory were investigated, and the corresponding
standard adsorption and wetting values were detd. The
energy of adsorption of hexane upon graphite was calcd.
theoretically by summation on 100 closest graphite lattice
atoms. The dispersional interaction of the adsorbed mol.
of hydrocarbons is a linear function of the no. of C atoms in
them. The theoretical and exper. values for the adsorption
energy agree.

W. M. Sternberg

PM

LYGINA, I. A.

Distr: 4E4j/4E2c(j)

7
Energy of adsorption bond and heat of adsorption of n -alkanes on carbon black. N. N. Avnii, G. I. Beresin, A. V. Kiselev, and I. A. Lygina. *Izv. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1957, 1021-31 (1957).—In a calorimeter of const. heat exchange, abs. isotherms of adsorption and differential heat of adsorption of pentane, heptane, and octane vapors on C black were detd. and compared with those obtained previously. The thermodynamic characteristics of adsorption and wetting were also detd. The standard values of total and free energy and entropy and entropy of adsorption are linear functions of the no. (n) of C atoms in the mol. The heat of wetting is independent of n . An approx. equation for the isotherm const. of adsorption of these n -alkanes is given. Theoretically calcd. dependence of the energy of adsorption of n -alkanes on carbon black on n , $\epsilon = 0.9 + 1.25 n$ kcal./mole, gives results that agree satisfactorily with those obtained experimentally.

A. Libackyi

ppj R

Lygina, I. A.
AUTHORS: Avgul', N. N., Isirikyan, A. A., 62-11-4/29
Kiselev, A. V., Lygina, I. A., Poshkus, D. P.
TITLE: Adsorption Equilibria and the Energy of Adsorption
Powers (Adsorbtsionnyye ravnovesiya i energiya
adsorbtsionnykh sil).
PERIODICAL: Izvestiya AN SSSR, Otdel. Khim. Nauk, 1957, Nr 11,
pp. 1314-1327 (USSR)
ABSTRACT: Here the theoretical and experimental investigation of the
adsorption powers in physical adsorption, mainly of complicated
non-polar molecules with adsorbents of an atomic and ionic
lattice, is brought. The results of the theoretical
computation are compared with the measurements of the dif-
ferential heats of the adsorption. Here a method for the
computation of the adsorption energy of non-polar molecules
with regard to three terms in the potential of the dispersion
powers with constants, which are computed by means of
polarizability and magnetization-coefficients, was worked
out. With it the induction potential by the average
polarizability of the adsorbed substance and the average
electrostatic field of the adsorbent was taken into
consideration. Furthermore the push-off potential with a

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Adsorption Equilibria and the Energy of Adsorption Powers 62-11-4/29

constant in the exponent, which is computed from the individual constants of the adsorbent, is taken into consideration. Finally all interactions of the given power center of the molecule of the adsorbed substance are added up with all adsorbent-lattice centers. The push-off constant before the exponential function is determined from the condition of the minimum of total energy of all interactions in an equilibrium distance from the adsorbent-surface. It is shown that the computed adsorption energy amounts of inert gases, nitrogen and 13 hydrocarbons of different structure (normal and isomeric alkanes, alcene, aromatical ones) on graphite are similar to the measured adsorption heats on graphited soot. It is shown that the computed adsorption energy amounts of the n-alkanes, of the benzene and toluene on magnesium oxide are also similar to the measured adsorption-heats. Furthermore it is shown, that in the case of an adsorption on graphite the amounts of the first, second and third term of the energy of dispersion powers and the absolute amount of the push-off energy were 90-95, or 5-10, or 0.5 - 1, or 35 - 40 % respectively of the total energy of dispersion powers in the investigated

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Adsorption Equilibria and the Energy of Adsorption Powers 62-11-4/29

adsorbed substances (adsorbates?) In the adsorption on MgO the amounts of the first, second and third term of the energy of dispersion powers, of the energy of induction powers and the absolute amount of push-off energy were about 81-83, or 12-14, or 3, or 2, or 42-48 % respectively of the total energy of the attractive powers (the dispersion and induction powers). There are 4 figures, 3 tables, and 41 references, 15 of which are Slavic.

ASSOCIATION: Institute of Physical Chemistry of the AS USSR and Laboratory of Adsorption at the Moscow State University imeni M. V. Lomonosova (Institut fizicheskoy khimii Akademii nauk SSSR i Laboratoriya adsorbtsii Moskovskogo Gosudarstvennogo universiteta im. M. V. Lomonosova).

SUBMITTED: September 3, 1957

AVAILABLE: Library of Congress

Card 3/3

LYGIA, L.A.

The effect of porosity of graphite adsorbents on the adsorption and the heat of adsorption of C_{60} vapor. N. N. Avgul, G. I. Berzin, A. V. Stetsko, and G. G. Mstislavskii. *Zhur. Fiz. Khim.* 31, 1731-1736 (1957). The C_{60} vapor adsorption was studied with an adsorption calorimeter, "artificial charcoal" being used, either loose, nonporous C-black powder, P-33 (Polley, *et al.*, *Col.* 47, 7285b) to eliminate the secondary adsorption effects of capillary condensation, or compacted under 200 kg/cm² and a sample of selected activated charcoal (purified of uniform fine porosity, obtained at 1000° to a 45% loss in wt., and then heated in H_2 at 1700°). The isotherms and the heats of adsorption of C_{60} on the "charcoal" and the activated char coincided in the adsorption range. A difference appears in the reversible and irreversible parts of the capillary condensation range. A distinct reversible hysteresis was observed with the "charcoal" sample in a narrow range of relative pressures, similar to the capillary condensation in uniformly coarse-pore gels. The heat of adsorption with char was greater than in the nonporous sample, causing an increase in the energetic interaction of the C_{60} molecule with the C in the finest pores. The heat of adsorption passes through a sharp max. with C_{60} . This max. is caused by the compression of the liquid in the "charcoal" pores when the hydrostatic pressure (caused by the curved meniscus) is eliminated at the mouth of the pores at the "charcoal" surfaces. W. M. Stetsko.

LYGINA, I. A., Cand Chem Sci -- (diss) "Energy of adsorption of hydrocarbons on graphitized carbon black." Mos, 1958. 14 pp (Acad Sci USSR, Inst of Phys Chemistry), 100 copies (KL, 18-58, 96)

-20-

5 (4)

AUTHORS:

Avgul', N. N., Berezin, G. I.,
Kiselev, A. V., Lygina, I. A.

SOV/62-59-5-5/40

TITLE:

Adsorption Heat of a Number of Isoalkanes, Naphthenes and of Toluene
on Graphitized Carbon Black (Teplota adsorptsii ryada izoalka-
nov, naftenov i toluola na grafitirovannoy sazhe)

PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,
1959, Nr 5, pp 787 - 796 (USSR)

ABSTRACT:

In this work the following hydrocarbons were investigated as to
their adsorption heat: three isoalkanes (neohexane, isooctane,
and isooctane), two alicyclic hydrocarbons; cyclopentane and
methylcyclopentane, and the alkylaromatic compound toluene. The
hydrocarbons had been selected in this way in order to investi-
gate the effect of the chain branching, the ring formation of
these chains, and the introduction of aliphatic substituents
into the naphthene and benzene ring on adsorption. The hydro-
carbons used in the investigations had been synthesized at the
Institut organicheskoy khimii AN SSSR (Institute of Organic Che-
mistry of the AS, USSR) by Ye. A. Mikhaylova, A. F. Plate, A. I.
Liberman, and S. V. Zotova. The authors express their gratitude
for their help. The constants of these substances are summariz-

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Adsorption Heat of a Number of Isoalkanes, Naphthalenes
and of Toluene on Graphitized Carbon Black SOV/62-59-5-5/40

ed in table 1. "Sferon"-6 was used as adsorbent; it was graphitized at 1700° . The differential adsorption heat was determined at 20° in a calorimeter with constant heat exchange; the amount of the adsorption was determined by means of a capillary vacuum liquid microburet. Figures 1, 2 show the isothermal lines of adsorption of the various substances and figures 3, 4 show the dependence of the differential adsorption heat on the amount of heat adsorbed by the individual substances. The figures show that the normal adsorption heat of isoalkanes and naphthalenes is lower than that of the corresponding n-alkanes. The value of the adsorption heat of cyclopentane amounts to only half of that of n-pentane. Cyclopentane, therefore, shows greater attraction towards the adsorption layer, its isothermal line of adsorption is concave at its beginning. It can be seen from the thermodynamic evaluation of the experimental data obtained that the isothermal line of adsorption of cyclopentane cannot be represented by the Langmuir equation or BET equation but by an equation which allows for the interaction adsorbate-adsorbate

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Adsorption Heat of a Number of Isoalkanes, Naphthenes and of Toluene on Graphitized Carbon Black SOV/62-59-5-5/40

(Fig 5). The entropy curves (Fig 6) indicate that the state of isoalkanes and naphthenes in the dense adsorption layer on graphite is much closer to the liquid state than that of n-alkanes. The methyl group in the toluene molecule reduces its mobility with respect to the unsubstituted benzene and the other purely cyclic compounds. With regard to the theoretical calculation of adsorption heat it was assumed that, in the case of the ramified hydrocarbons, the adsorption heat is an additive function of the number of carbon atoms in the molecule. The free adsorption energy and the surface of the adsorbent occupied by molecules were determined according to the same assumption. There are 6 figures, 3 tables, and 17 references, 12 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

SUBMITTED: July 25, 1957

Card 3/3

5 (2), 5 (4)
AUTHORS:

Avgul' N. N., Kiselev, A. V.,
Lygina, I. A., Poshkus, D. P.

SOV/62-59-7-7/38

TITLE:

A Contribution to the Calculation of the Energy of the Adsorption of Nonpolar Molecules on Graphite (K raschetu energii adsorbtsii nepolyarnykh molekul na grafite)

PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 7, pp 1196-1206 (USSR)

ABSTRACT:

In this paper the details of a calculation of the adsorption energies of simple and compound molecules carried out in a previous paper are represented. The calculations were carried out according to the formulas from paper reference 1 according to which the adsorption energy is determined by the expressions

$$\Phi_i' = - C_{i1} \sum_j r_{ij}^{-6} - C_{i2} \sum_j r_{ij}^{-8} - C_{i3} \sum_j r_{ij}^{-10} + B_i' \sum_j e^{-r_{ij}/\rho}$$

$$\Phi_i'' = - C_{i1} \sum_j r_{ij}^{-6} - C_{i2} \sum_j r_{ij}^{-8} - C_{i3} \sum_j r_{ij}^{-10} + B_i'' \sum_j r_{ij}^{-12}$$

r_{ij} is the distance of the center of the i-th adsorption molecule from the center of the j-th atom of the adsorbent.

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A Contribution to the Calculation of the Energy of the SOV/62-59-7-7/38
Adsorption of Nonpolar Molecules on Graphite

$C_{i1,2,3}$ are constants of the dispersion reaction, B' and B'' are the constant of the exponential function and the constant of the repulsion preceding the powers. Q is an exponential constant of the repulsion. The calculation is carried out in two parts, the geometric one in which the distances of the adsorbed link i to all atoms j of the lattice of the adsorbent are calculated for different distances of the former from the surface. For this calculation only the lattice constants of the adsorbent have to be known. For the second part of the calculation of the forces the constants characterizing the reactions of both substances have to be determined. The calculation of the sums of r_{ij} was carried out for $n = 6, 8, 10$ and 12 for the different distances of the adsorbed link from the basis of the adsorbent equal to $2, 2.5, 3, 3.5$ a (a is the distance of the nearest atom). In table 1 the results of the calculation of the sums

$\sum_{i=1}^n r_{ij}^{-n}$ are combined. The distances of the remaining graphite volume were determined from the integrals (3), (4), (5) (Table 2).

Card 2/4

A Contribution to the Calculation of the Energy of the SOV/62-59-7-7/38
Adsorption of Nonpolar Molecules on Graphite

The sums $\sum_{i,j}^{r_1} r_{ij}^{-n} + \int_{(n)}$ are represented in tables 4 and 5 and the graphic representation in figure 2. The value $\sum e^{-r_{ij}/0.28}$ for Q in table 6 was equated to 0.28 according to reference 6. For the sums of tables 4, 5 a simplified form with the constants p_n and q_n , the values of which are given in table 7, is introduced and the functions (1) and (2) are represented in the variable z

(6), (7). $\left(\sum_{i,j}^{r_1} r_{ij}^{-n} + \int_{(n)} = p_n z^{-q_n} \right)$. Next, the calculation of the reaction constant $C_{i1,2,3}$ is carried out. The values for different adsorptives are given in table 7 with the constants α and χ (polarizability, magnetic susceptibility) being necessary for the calculation of $C_{i1,2,3}$. ϕ' and ϕ'' were then determined by the aid of computed constants. The results for ϕ''

Card 3/4

A Contribution to the Calculation of the Energy of the Adsorption of Nonpolar Molecules on Graphite SOV/62-59-7-7/38

are given in tables 10 and 11. The calculation of the attraction- and repulsion constants was carried out from the balance energy of the adsorption of compound molecules on the basis of an additive scheme. There are 6 figures, 11 tables, and 8 references, 2 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)
Khimicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova (Chemical Department of the Moscow State University imeni M. V. Lomonosov)

SUBMITTED: November 16, 1957

Card 4/4

AVGUL', N.N.; BEREZIN, G.I.; KISELEV, A.V.; LYGINA, I.A.

Adsorption and the heat of adsorption of n-pentane and n-hexane
on barium sulfate. Izv. AN SSSR.Otd. khim. nauk no.11:1948-1954
N '60. (MIRA 13:11)

1. Institut fizicheskoy khimii AN SSSR.
(Heat of adsorption) (Pentane) (Hexane) (Barium sulfate)

AVGUL', N.N.; BEREZIN, G.I.; KISELEV, A.V.; LYGINA, I.A.

Adsorption and heat of adsorption of normal alcohols on graphitized
carbon black. Izv. AN SSSR. Otd. khim. nauk no.2:205-214 P '61.
(MIRA 14:2)

1. Institut fizicheskoy khimii AN SSSR.
(Adsorption) (Carbon black) (Alcohols)

AVGUL', N.N.; KISELEV, A.V.; LYGINA, I.A.

Adsorption energy of CO_2 , SO_2 , $(\text{CH}_3)_2\text{CO}$ and $(\text{C}_2\text{F}_5)_2\text{O}$ on
graphite. Izv. AN SSSR. Otd.khim.nauk no.8:13^c 21403 Ag
'61. (MIRA 14:8)

1. Institut fizicheskoy khimii AN SSSR.
(Adsorption)

AVGUL', N.N.; KISELEV, A.V.; LYGINA, I.A.

Adsorption energy of water, alcohols, ammonia, and methylamine
on graphite. Izv. AN SSSR. Otd.khim.nauk no.8:1404-1411
Ag '61. (MIRA 14:8)

1. Institut fizicheskoy khimii AN SSSR.
(Adsorption)

AVGUL', N.N.; KISELEV, A.V.; LYGINA, I.A.

Isotherms and heats of adsorption of alcohols on carbon blacks of various degrees of graphitization [with summary in English].
Koll.zhur. 23 no.4:369-375 J1-Ag '61. (MIRA 14:8)

1. Institut fizicheskoy khimii AN SSSR, Gruppya khimii poverkhnosti, Moskva.

(Alcohols) (Heat of adsorption)

AVGUL', N.N.; KISELEV, A.V.; LYGINA, I.A.

Adsorption and heat of adsorption of isomeric butanols on
graphitized carbon black. Koll.zhur. 23 no.5:513-520 S-0 '61.
(MIRA 14:9)

1. Institut fizicheskoy khimii AN SSSR, Gruppya khimii poverk-
hnosti, Moskva.
(Butyl alcohol) (Heat of adsorption)

AVGUL', N.N.; KISELEV, A.V.; LYGINA, I.A.

Adsorption and heat of adsorption of diethyl ether, acetone, and acetic acid vapors on graphitized carbon black. Izv. AN SSSR Otd.khim.nauk no.12:2116-2125 D '61. (MIRA 14:11)

1. Institut fizicheskoy khimii AN SSSR.
(Adsorption) (Ethers) (Acetone) (Acetic acid)

AVGUL', N.N.; KISELEV, A.V.; LYGINA, I.A.

Adsorption and the heat of adsorption of pyridine and benzene vapors on graphitized carbon black. Izv. AN SSSR Otd.khim.nauk (MIRA 15:1)
no.1:32-37 Ja '62.

1. Institut fizicheskoy khimii AN SSSR.
(Pyridine) (Benzene) (Heat of adsorption)

AVGUL', N.N.; KISELEV, A.V.; LYGINA, I.A.

Potential energy of adsorption of sphere-shaped molecules of C_6H_6 , $\text{C}(\text{CH}_3)_4$, and CCl_4 on graphite. Izv.AN SSSR.Otd.khim.nauk
no.8:1346-1353 Ag '62. (MIRA 15:8)

1. Institut fizicheskoy khimii AN SSSR.
(Adsorption) (Molecules)

AVGUL', N.N.; KISELEV, A.V.; LYGINA, I.A.

Molecular-statistical evaluation of the change of thermodynamic functions in CH_4 adsorption on graphite. Izv. AN SSSR. Otd. khim. nauk no. 8:1353-1357 Ag '62. (MIRA 15:8)

1. Institut fizicheskoy khimii AN SSSR.
(Methane) (Adsorption)

S/069/63/025/002/001/010
A057/A126

AUTHORS: Avgul', N.N., Kiselev, A.V., Lopatkin, A.A., Lygina, I.A., Serdobov, M.V.

TITLE: Nature of adsorption by zeolites. Heat of adsorption of benzene and n-hexane vapors by zeolite type 13 X (13Kh)

PERIODICAL: Kolloidnyy zhurnal, v. 25, no. 2, 1963, 129 - 135

TEXT: The differential adsorption heats of benzene and n-hexane vapors on 13Kh zeolite crystals were measured calorimetrically. The measured adsorption heats are approximately twice as high as the corresponding heats of condensation. The initial heat of adsorption of benzene is by about 3 kcal/mole higher than that of n-hexane. Little change was observed in the heat of adsorption of benzene with the degree of adsorption, while a considerable rise occurs for n-hexane. This observation was made also with graphitized soot and explained by the interaction of the n-hexane molecules in the adsorption layer of the non-polarized soot surface. Discussing the possible arrangements of the benzene and n-hexane molecules in larger cavities of the zeolite, the authors state: There

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S/069/63/025/002/001/010
A057/A126

Nature of adsorption by zeolites. Heat of

are four sites in the cavity walls having cations in their centers which are favorable for the localization of benzene molecules. It can be assumed that the stretched and flexible n-hexane molecules depend less on the position of these cations. Hence, the adsorption of n-hexane is less localized in comparison to benzene. The adsorption on zeolites, however, is highly affected by the geometric and electronic structure of the adsorbed molecules, the geometry of the cavities, and the nature of the electric field of the adsorbent. The packing of molecules of the adsorbate in the zeolite cavities differs, therefore, from their packing in the liquid state. Thus Polyani's potential theory of adsorption cannot be applied to the adsorption of hydrocarbon vapors by zeolites. The state and packing of hydrocarbon molecules in zeolite cavities will find further explanations by experiments with n-alkanes with molecules of different lengths and their substitutes with various functional groups, plane molecules, and different electron structure, as well as adsorption experiments with small molecules (nitrogen, argon) after adsorption of highly adsorptive large molecules, which are loosely filling the cavities. There are 4 figures.

ASSOCIATION: Moskovskiy universitet, Khimicheskii fakul'tet (Moscow University,

Card 2/3

Nature of adsorption by zeolites. Heat of

8/069/63/025/002/001/010
A057/A126

Chemical Department); Institut fizicheskoy khimii AN SSSR, Gruppya
khimii poverkhnosti (Institute of Physical Chemistry of the AS
USSR, Team for Surface Chemistry)

SUBMITTED: July 12, 1962

Card 3/3

AVCUL', H.W.; KISELEV, A.V.; LYGINA, I.A. (Moscow;

Standard thermodynamic characteristics of adsorption on a homogeneous surface and the activity coefficients of adsorbate in the adsorption layer. Zhur.fiz.khim. 38 no.8:2055-2058 Ag '64.

(MIRA 18:1)

1. Institut fizicheskoy khimii AN SSSR.

KISELEV, A.V.; LYGINA, I.A.

Potential energy of Ne, Ar, Kr, Xe, and CH₄ crystal lattices. Izv.
AN SSSR. Ser. khim. no. 7:1143-1151 '65. (MIRA 18:7)

1. Institut fizicheskoy khimii AN SSSR.

RATUSHNYY, G.D.; KOMAROVA, S.N.; LYGINA, N.I.; POGREBYNIAK, E.G.

Application of ion exchange for the acidification of fruit and
berry juices. Trudy KIPP no.22:371-374 '61. (MIRA 16:4)
(Fruit juices) (Ion exchange)

LYGINA, T.I., Soviet Sci--(Sci) "On the chemical structure of the
ecology of phthalide." Kiev, [1957], 13 pp (Kiev Order of Lenin Inst of
Inst in A.S. Bogomolov), 200 cop. (K, 31-81, 108)

LYGINA, T.I.

Effect of phthivazid on the morphological picture of the blood.
Vrach.delo no.5:487-489 My '57. (MLRA 10:8)

1. Kafedra farmakologii (zav. - chlen-korrespondent AMN SSSR, prof.
A.I.Cherkas) Kiyevskogo meditsinskogo instituta
(ISONICOTINIC ACID) (BLOOD)

~~LYC DIA, T-1.~~

Cardiovascular changes induced by phthivazid. Vrach.delo
no.1:57-59 Ja '58. (MIRA 11:3)

1. Kafedra farmakologii (zav.-chlen-korrespondent AMN SSSR, prof.
A.I.Cherkas) Kiyevskogo meditsinskogo instituta.
(CARDIOVASCULAR SYSTEM) (ISONICOTINIC ACID)

LYGINA, T.I.

Absorption, distribution and excretion of phthivazide. Farm. i toks 21
no.6:62-64 H-D '58. (MIRA 12:1)

1. Kafedra farmakologii (zav. - chlen-korrespondent AMN SSSR prof. A.I.
Cherkes) Kiyevskogo ordena Trudovogo Krasnogo Znameni meditsinskogo in-
stitutu imeni akad. A.A. Bogomol'tsa.

(ISONIAZID, metab.
absorp., distribution & excretion (Rus))

LYGINA, T.I., kand.med.nauk

Some pharmacological characteristics of ketone of palmitic acid.
Akush.i gin. 35 no.6:23-25 N-D '59. (MIRA 13:4)

1. Iz laboratorii po izyskaniyu i izucheniyu protivozachatochnykh sredstv (zaveduyushchiy - prof. Ye.F. Shamray) Instituta okhrany materinstva i detstva imeni Geroya Sovetskogo Soyuza prof. F.M. Buyko (direktor - dotsent A.G. Pan) Ministerstva zdravookhraneniya USSR.

(FATTY ACIDS pharmacol.)
(CONTRACEPTIVES)

BOGATSKAYA, L.N., dotsent; LYGINA, T.I., starshiy nauchnyy sotrudnik

Pharmacological characteristics of galascorbin. Vrach.delo
no.2:203 F '60. (MIRA 13:6)

1. Kafedra biokhimii (zav. - prof. Ye.F. Shamray) Kiyevskogo
meditsinskogo instituta,
(ASCORBIC ACID)

LYGINA, V. V.

"Obtaining of Hedenite [Ozocerite-Like Wax] and Anorthite
(Indianite) During Reactions in the Solid State." Cand Geol-Min
Sci, [no Inst given], Leningrad, 1954. (RZhGeol, Sep 54)

SO: Sum 432, 29 Mar 55

15-57-7-9443

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 3,
p 103 (USSR)

AUTHOR: Lygina, V. V.

TITLE: Obtaining Gehlenite and Anorthite by Reaction in Solid
Solution (Polucheniye gelenita i anortita pri reaktsii
v tverdom sostoyanii)

PERIODICAL: Uch. zap. Leningr. gos. ped. in-ta, 1956, Nr 117,
pp 33-54

ABSTRACT: Pure preparations of CaO , CaCO_3 , Al_2O_3 , $\text{Al}(\text{OH})_3$, and
 SiO_2 , crystalline and amorphous, and nearly pure kaolin
were used as the initial products for synthesizing geh-
lenite ($2\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot \text{SiO}_2$) and anorthite ($\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2$).
Preliminary treatment consisted of heating, drying, and
determination of the chemical composition, chiefly to
determine the iron oxide admixture. A mixture having
the stoichiometric relations of anorthite and gehlenite
was prepared from carefully ground material. Minerali-
zers were added in the proportion of one percent by

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15-57-7-9443

Obtaining Gehlenite and Anorthite by Reaction (Cont.)

weight. These were: apatite, fluorite, cryolite, molybdic acid, and tungsten anhydride. The mixtures were heated in electric furnaces at 900°, 1000°, 1100°, and 1200° for periods of 2.5 and 10 hours. The products of roasting were examined in immersion media under the microscope. In some instances X-ray powder patterns were made. The reaction rate in the solid state proved to be very low, especially when the mixture consisted of the pure oxides CaO, Al₂O₃, and SiO₂. The rate increased markedly when a gas phase was present; when CaO was introduced in CaCO₃, and Al₂O₃ was derived from Al(OH)₃. The use of amorphous SiO₂ in addition to crystalline material somewhat increased the reaction rate. Fluorite and apatite proved to be the most effective mineralizers. Study of the synthetic products of the temperature stages from 900° to 1200° has shown that the same intermediate products are formed during the synthesis of both gehlenite and anorthite. A schematic course of reaction for both minerals may be represented by the following intermediate reaction equations: 1) $n\text{CaO} + m\text{Al}_2\text{O}_3 = n\text{CaO} \cdot m\text{Al}_2\text{O}_3$ (n;m = 12;7); 2) $2\text{CaO} + \text{SiO}_2 = \beta\text{-Ca}_2\text{SiO}_4$ or 3) $n\text{CaO} \cdot m\text{Al}_2\text{O}_3 + \text{SiO}_2 = \beta\text{-Ca}_2\text{SiO}_4 + \text{CaO} \cdot \text{Al}_2\text{O}_3$; 4) $\beta\text{-Ca}_2\text{SiO}_4 + \text{Al}_2\text{O}_3 = \text{CaO} \cdot \text{Al}_2\text{O}_3 + \text{CaSiO}_3$; 5)

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15-57-7-9443

Obtaining Gehlenite and Anorthite by Reaction (Cont.)

$\text{CaO} \cdot \text{Al}_2\text{O}_3 + \text{CaSiO}_3 = 2\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot \text{SiO}_2$ (gehlenite); and 6)
 $2\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot \text{SiO}_2 + 2\text{SiO}_2 = \text{CaSiO}_3 + \text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2$ (anorthite).
 According to this scheme, gehlenite is formed from the high-temperature combination of $\text{CaO} \cdot \text{Al}_2\text{O}_3$ and CaSiO_3 and not from $12\text{CaO} \cdot 7\text{Al}_2\text{O}_3$ and CaSiO_3 as Yander (?) and Petri (?) had stated. Gehlenite, as an intermediate product during the formation of anorthite, was discovered in slags composed of CaCO_3 — kaolin, and this, too, is in disagreement with the results of Yander and Petri. The optimum conditions for synthesizing gehlenite and anorthite by reaction in the solid state are a temperature of 1200° and sustained heating for at least 10 hours. The initial materials for this synthesis should be amorphous SiO_2 , CaCO_3 , and $\text{Al}(\text{OH})_3$. The sequence of formation of combinations in the solid state in the system $\text{CaO}-\text{Al}_2\text{O}_3-\text{SiO}_2$ has shown that the most mobile component in the system is CaO , and the most inert is SiO_2 . This circumstance may explain the earlier and more frequent formation of gehlenite in these experiments than anorthite, and also the rare discovery of gehlenite in nature as an intermediate reaction product during the formation of anorthite.

Card 3/3

A. A. Leont'yeva

LYGINA, V.V.; SARANCHINA, G.M.

Geology and the characteristics of the metamorphism of crystalline rocks in the northern part of the Karelian Isthmus (in the vicinity of Kuznechnoye). Vop.magn.i metam. 2:115-137 '64.

(MIRA 18:3)

~~LYGUN, M.I.~~

Terminology in orthopedic stomatology. Stomatologiya 35 no.5:48-50
S-O '56 (MLRA 10:4)

1. Iz kafedry chelyustno-litsevoy khirurgii i stomatologii (nach.-
prof. V.M. Mukhin) Voenno-meditsinskoy ordena Lenina akademii imeni
S.M. Kirova.

(STOMATOLOGY--TERMINOLOGY)

LYGUN, M.I. (Leningrad)

Functional method of determining central occlusion. Stomatologia
38 no.5:50-52 S-O '59. (MIRA 13:3)
(MASTICATION)

LYGUN, M.I. (Baku)

A few practical suggestions in the technique of dental prosthesis.
Stomatologiya 42 no.3:101 My-Je'63 (MIRA 17:1)

AUTHOR: Lygun, P.P. SOV/130-58-7-17/35
TITLE: Friendly Mutual Assistance (Tovarishcheskaya vzaimopomoshch')
PERIODICAL: Metallurg, 1958, Nr 7, p 34 + 4 plates on pp.14-15(USSR)
ABSTRACT: The author states that the crew of his blast furnace at the imeni Dzerzhinskogo (imeni Dzerzhinskiy) Works produced 3,989 tons of pig iron more than planned in the first quarter of this year. He says that efforts are being made to increase production still further and notes that the competitive marks system has been abandoned. All are now helping each other. There is 1 illustration.
ASSOCIATION: imeni Dzerzhinskiy Works
Card 1/1 1. Blast furnaces 2. Iron--Production

LYKA, Karoly

Bertalan Székely; his historical paintings, 1860-1870.
Elet tud 15 no.22:687-690 29 My '60.

LYKA, Karoly

Light and color dreams of Janos Vaszary. Elet tud 15
no.30:943-947 24 J1 '60.

LYKA, Karoly

"Becoming acquainted with arts" by Tivadar Artner. Reviewed
by Karoly Lyka. Elet tud 15 no.36:1146 4 S '60.

LYKA, Karoly

Munkacsy and his Hungarian people. Elet tud 15 no.45:1423-
1426 6 N '60.

LYKA, Karoly

The master of Zebegeny; to the memory of Istvan Szonyi. Elet
tud 15 no.51:1614-1618 18 D '60.

LYKA, Karoly

In commemoration of Jozsef Egry on the 100th anniversary of his death. Elet tud 16 no.8:240-244 19 F '61.

LYKA, Karoly

Jean Francois Millet, painter and poet of village life. Elettud 16 no.53:1680-1684 31 D '61.

LYKA, Karoly

To the memory of Karoly Kernstok. Elet tud 17 no.33:1038-1042
19 Ag '62.

LYKA, Karoly

Paul Gauguin, painter of the tropics. Elet tud 17 no.24:751-755 17 Je
'62.

L 10315-67 EW1(m)/EWP(k)/EWP(t)/ETI JD
 ACC NR: AR6013858 (A, N) SOURCE CODE: UR/0276/65/000/011/0046/0046 21
 AUTHORS: Gerike, L.; Volchkov, Ye.; Lykasov, N.; Bogarsukov, I.
 TITLE: Department of high accuracy casting with the use of melting patterns, at the Kuznetsk machine construction factory
 SOURCE: Ref. zh. Tekhnologiya mashinostroyeniya, Abs. 11G360
 REF SOURCE: Tr. Mezhotrasl. n.-i. proyektno-tekhrol. in-ta po avtomatiz. i mekhaniz. mashinostr. vyp. 1, 1963, 154-159
 TOPIC TAGS: metal casting, machine industry
 ABSTRACT: A casting department, designed by the MNIPTMASH institute for producing 1000 tons/year, is described. The project includes three independent sections: a section for producing low temperature melting patterns, application of heat resistant layers, drying of the molds and burning out the patterns; a section for drying, forming, firing, pouring, and removal of the castings; a section for trimming, cleaning, and leaching of the castings. Yearly output per worker will be 1.5 times higher than at the casting department of the Podol'sk mechanical factory and 2.5 times higher than at the existing casting department of the Kuznetsk factory. 4 illustrations. Bibliography of 4 titles. L. Yanovskaya /Translation of abstract/
 SUB CODE: 13, 11
 Card 1/1 BP UDC: 621.74.045

LYKHACHEV, M. F., LYUBIMOV, A. L., STAVINSKIY, V. S.,

"Gas Cerenkov Counters of the K -Meson Channel of the Syvchronophasotron"

paper presented at the Intl Conference on High Energy Physics, Rochester, N. Y.
and/or Berkly California, 25 Aug - 16 Sep 1960.

L 20788-66 EWT(m)/T/EWP(t) IJP(c) JD/JG

ACC NR: AP6005560

SOURCE CODE: UR/0148/65/000/010/0101/0105

AUTHOR: Grdina, Yu. V.; Lykhin, I. D.

ORG: Siberian Metallurgical Institute (Sibirskiy metallurgicheskiy institut)

TITLE: Structure of vanadium-carbon alloys

SOURCE: IVUZ. Chernaya metallurgiya, no. 10, 1965, 101-105

TOPIC TAGS: vanadium containing alloy, carbide, ternary alloy, phase composition, chemical composition

ABSTRACT: To fill the gap in the existing knowledge of the phase composition of Fe-V-C ternary alloys, it is primarily necessary to investigate the composition and structure of the carbide phase of the V-C system. So far there has not been much agreement on the chemical composition of the carbides in the V-C system but at any rate it is now generally admitted that two types of carbides form in this system: with hexagonal (V_2C) and cubic face-centered lattice (VC). But the boundaries of homogeneity of the carbide phases have not previously been conclusively determined. In this connection, the authors investigated alloys made of pure V (99.825%) and spectrally pure graphite. One part of the alloy was investigated in "natural" state while the other was vacuum-annealed (10^{-3} mm Hg) in quartz tubes at 1000, 750 and 550°C for 100 hr, with subsequent metallographic and radiographic examination of the

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UDC: 669.292;669.784;620.183

L 20788-66

ACC NR: AP6005560

specimens and electrolytic precipitation of the carbide residue. It was
lished that the homogeneous region for the carbide V_2C with hexagonal lattice
from 9.6 to 10.45% C (wt.), while for the carbide VC with cubic lattice it extends
from 12.5 to 17.8% C (wt.). A comparison of the findings with the conflicting data
available in the published literature shows that the lower boundary of stability of
the vanadium carbide VC with cubic lattice cannot as yet be conclusively established.
owing to the diversity of investigating techniques employed by various researchers.
On the other hand, the findings on the upper level of concentration of C in the car-
bides VC, specifying it at from 16.6 to 17.8%, are generally in close agreement.
Orig. art. has: 2 figures, 2 tables.

SUB CODE: 11, 13, 20/ SUBM DATE: 09Apr65/ ORIG REF: 004/ OTH REF: 006

Card 2/2
APPROVED FOR RELEASE

L 20788-66

ACC NR: AP6005560

specimens and electrolytic precipitation of the carbide residue. It was thus established that the homogeneous region for the carbide V_2C with hexagonal lattice extends from 9.6 to 10.45% C (wt.), while for the carbide VC with cubic lattice it extends from 12.5 to 17.8% C (wt.). A comparison of the findings with the conflicting data available in the published literature shows that the lower boundary of stability of the vanadium carbide VC with cubic lattice cannot as yet be conclusively established owing to the diversity of investigating techniques employed by various researchers. On the other hand, the findings on the upper level of concentration of C in the carbides VC, specifying it at from 16.6 to 17.8%, are generally in close agreement. Orig. art. has: 2 figures, 2 tables.

SUB CODE: 11, 13, 20/ SUBM DATE: 09Apr65/ ORIG REF: 004/ OTH REF: 006

Card

2/2

LYKHIN, P.A., kandidat tekhnicheskikh nauk.

"Choice of borehole diameter in underground mining." V.M. Mostkov.
Reviewed by P.A. Lykhin. Ugol' 31 no.6:48 Jo '56. (MLRA 9:8)

1. Dal'nevostochnyy politekhnicheskiiy institut imeni Kuybysheva.
(Boring) (Mostkov, V.M.)

LYKHIN, Pavel Aleksandrovich

~~LYKHIN~~, Pavel Aleksandrovich; UTKIN, L.A., red.; TSYMBALIST, N.N., red.
izd-va; ZEP, Ye.M., tekhn.red.

[Using drilling and blasting techniques in intensifying horizontal
mining] Intensifikatsiia provedeniia gorizonta'l'nykh gornykh vyrabo-
tok buro-vzryvnym sposobom. Sverdlovsk, Gos. nauchno-tekhn.izd-vo
lit-ry po chernoi i tsvetnoi metallurgii, Sverdlovskoe otd-nie,
1957. 137 p. (MIRA 11:3)
(Mining engineering)

LYKHIN, P.A.

3-58-3-22/32

AUTHOR: Lykhin, P.A., Candidate of Technical Sciences

TITLE: On the Experience of Establishing a Semi-Industrial Mining Laboratory (Iz opyta sozdaniya poluproizvodstvennoy gornoy laboratorii)

PERIODICAL: Vestnik Vysshey Shkoly, 1958, Nr 3, pp 76 - 78 (USSR)

ABSTRACT: Laboratory exercises of mining students frequently are not adequate. The students have access only to models or equipment which enable them to study the construction and material of the machines, but are given no opportunity to work on them. The student, therefore, cannot gain sufficient knowledge of a machine. Also, during practical training he is usually not permitted to operate a machine. Thus, a mining student of the 3rd or 4th course is often unable to properly carry out a number of tasks, including blasting operations. To improve the training of mining engineers, the Chair of Mining of Mineral Resource Deposits of the Far-East Polytechnical Institute imeni V.V. Kuybyshev decided to organize an underground laboratory for boring and blasting operations and drifting. The laboratory will consist of a net of drifts of 150 m in length,

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On the Experience of Establishing a Semi-Industrial Mining Laboratory

including the adit, an electrical sub-station, compressor chamber, locomotive depot, the end of the mine's blind shaft with the chamber of a hoisting machine and several operating stopes of horizontal and upward workings, connected with the surface. The students worked successfully in this mining Laboratory during 1956/57. The construction of the underground laboratory is not as yet completed. There is 1 photo.

ASSOCIATION: Dal'nevostochnyy politekhnicheskiy institut imeni V.V. Kuybysheva (Far-East Polytechnical Institute imeni V.V. Kuybyshev)

AVAILABLE: Library of Congress

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SOV/118-58-11-6/19

AUTHORS: Lykhin, P.A., Candidate of Technical Sciences, and
Nevenchenko, I.I., Engineer

TITLE: The Execution of Mine Working Using the PK-3 in the Far East
Coastal Region (Provedeniye gornyykh vyrabotok kombaynom
PK-3 v Primor'ye)

PERIODICAL: Mekhanizatsiya trudoyemkikh i tyazhelykh rabot, 1958, Nr 11,
pp 21-23 (USSR)

ABSTRACT: This is an article referring to the use of the coal combine,
type PK-3, at the Artemovskoye burougol'noye mestorozhdeniye
(Artemovskoye coal deposit) in the Primor'ye territory. In
1957, a total of 5,282 linear meters of excavation were
driven by the PK-3 combine. The average speed was 273 meters
per month (for technical details see Table 1). On the whole,
the operation of the PK-3 horizontal driving combine is said
to be satisfactory, though 17 % of the working time must be
wasted for removing a 40 cm thick layer of coal or rock
manually. Other deficiencies noted: the face flushing

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The Execution of Mine Working Using the PK-3 in the Far East Coastal Region

system does not work satisfactorily, the PT-3 combine has no appliances for mechanical roof supporting at the stope. There are 6 tables.

1. Mining engineering--USSR
2. Industrial equipment--Performance

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SOV/118-59-3-10/22

28(1)

AUTHOR: Lykhin, P.A., Candidate of Technical Sciences

TITLE: Use of Diesel Motors in Underground Conditions
(Primeneniye dizel'nykh dvigateley v podzemnykh usloviyakh)

PERIODICAL: Mekhanizatsiya i avtomatizatsiya proizvodstva, 1959,
Nr 3, p 30 (USSR)

ABSTRACT: The application of diesel motors in underground conditions entails great difficulties, especially in connection with the clearing away of gas. Nevertheless, such means of transportation have been employed in the pits of British Columbia since 1950. Much attention has to be paid to fire security during the use of equipment. It is recommended to use diesel fuel with a burning point of not lower than 66°C. The machines should be charged in specially equipped rooms. Experience in the use of diesel motors in underground conditions shows that the established security regulations do safeguard normal working conditions. Industry produces various kinds of

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Use of Diesel Motors in Underground Conditions

equipment using diesel motors, with an output of 40-120 HP. Enterprises possess explosion-safe equipment with diesel motors, successfully employed in the pits, endangered by explosions of gas and dust. The gas purifier is in the form of a metallic tub filled with water. Explosive gases passing through it lose their poisonous components. Experience shows, that the best diesel fuel for underground work has its burning point near 58°C.

Card 2/2

LYKHIN, P.A., kand. tekhn. nauk; PETROV, S.A., kand. tekhn. nauk;
ZIL'BERSHMIT, V.G., inzh.

Using detonite in the making of lateral drifts in coal mines.
Vzryv. delo no.55/12:115-120 '64. (MIRA 17:10)

ZAKHAROV, Yu.A.; BOLDYREV, V.V.; LYKHIN, V.M.; VOTINOVA, L.A.;
SAVEL'YEV, G.G.; BREGER, A.Kh.

Study of the effect of preliminary irradiation on the thermal
degradation of silver oxalate containing cadmium admixture.

Dokl.AN SSSR 145 no.1:122-124 J1 '62.

(MIRA 15:7)

1. Nauchno-issledovatel'skiy institut yadernoy fiziki, elektroniki
i avtomatiki pri Tomskom politekhnicheskoye imeni S.M.Kirova
i Fiziko-khimicheskiy institut imeni L.Ya.Kaprova. Predstavleno
akademikom M.M.Dubininym.

(Silver oxalate) (Cadmium) (Radiation)

BOLDYREV, V.V.; ZAKHAROV, Yu.A.; LYKHIN, V.M.; VOTINOVA, L.A.

Effect of the addition of cadmium ions on the thermal stability of silver oxalate. Kin.i kat. 4 no.5:672-682 S-O '63. (MIRA 16:12)

1. Nauchno-issledovatel'skiy institut yadernoy fiziki, elektroniki i avtomatiki pri Tomskom politekhnicheskoye imeni Kirova.

L 252h2-65 EWT(m)/EPF(c)/EPF(n)-2/EWP(j) Po-L/Pr-L/Pu-L GG/RM

ACCESSION NR: AP5001518

S/0020/64/159/005/1113/1116

AUTHOR: Boldyrev, V. V.; Oblivantsev, A. N.; Lykhin, V. M.

TITLE: ¹⁹Radiation stability of alkali metal azides to gamma rays

SOURCE: AN SSSR. Doklady, v. 159, no. 5, 1964, 1113-1116

TOPIC TAGS: alkali metal azide, alkali metal azide dissociation, radiation induced azide dissociation, thermal azide dissociation, azide ion crystal lattice

ABSTRACT: Data were sought for arranging the title products according to their radiostability, depending on the characteristics of the crystal lattice and the parameters of the lattice of the azide ion. These are tabulated and graphed. The azides of Na, K, Rb and Cs whose preparation is briefly described, were subjected to γ irradiation at a dose of 2.9×10^{16} ev/ml. sec. at 35-40 C, then tested for the presence of free metal and non-reacted acid ion in dependence of irradiation time. This stability was found to decrease in the order of Na, K, Rb and Cs, depending inversely on the cation radius; however the curves for the azide

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L 25242-65

ACCESSION NR: AP5001518

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ion obtained and those for the free metal did not coincide, due apparently to the formation of the nitrite ion, following ionization of the air or increase of the oxidation rate of the azide under irradiation. Linear dependence of the initial radiation-induced dissociation output upon the free volume of the elemental crystal cell points towards the effect of the packing density of the crystals on azide radiolysis which proceeds by diffusion of the radiation product. Crystal density seemed the most important determinant of radiation-induced yield, in contrast to that for thermal dissociation of these salts; this starts from active locations at exterior and interior defects of the crystal surface and is basically determined by the release of an electron from the azide ion. Radiation and thermal dissociation thus do not coincide although their endproducts are the same. "Irradiation was conducted on the gamma-instrument of the Institute of Nuclear Physics of the AN UzSSR by S. G. Pashinski to whom the authors wish to express their thanks."

Orig. art. has: 1 table and 2 figures

ASSOCIATION: Institut khimicheskoy kinetiki i goreniya Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Chemical Kinetics and Combustion, Siberian Division Academy of Sciences, SSSR); Nauchno-issledovatel'skiy Institut yadernoy fiziki pri Tomskom politekhnicheskom institut im. S. M. Kirova (Scientific

Card 2/3

L 25212-65

ACCESSION NR: AP5001518

Research Institute of Nuclear Physics, Tomsk Polytechnical Institute)

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SUB CODE: IC, GC

NR REF SOV: 007

OTHER: 013

Card 3/3

OBLIVANTSEV, A.N.; LYKHIN, V.M.; BOLDYREV, V.V.

Radiolysis of alkali metal perchlorates under the action of
gamma irradiation, Zhur.VKHO 10 no.5:598-599 '65.

(MIRA 18:11)

1. Tomskiy politekhnicheskii institut imeni Kirova.

ACC NR: AP6029225

SOURCE CODE: UR/0195/66/007/003/0432/0438

AUTHOR: Boldyrev, V. V.; Lykhin, V. M.; Oblivantsev, A. N.; Salikhov, K. M.

ORG: Institute of Chemical Kinetics and Combustion, SO AN SSSR (Institut khimicheskoy kinetiki i goreniya SO AN SSSR); Scientific Research Institute of Nuclear Physics, Tomsk Politechnic Institute (Nauchno-issledovatel'skiy institut yadernoy fiziki pri Tomskom politekhnicheskom institut)

TITLE: Effect of additives on the radiolysis of potassium nitrate

SOURCE: Kinetika i kataliz, v. 7, no. 3, 1966, 432-438

TOPIC TAGS: radiation chemistry, radiation effect, potassium compound, gamma irradiation

ABSTRACT: The effect of Tl^+ , Sr^{2+} , Pb^{2+} , and SO_4^{2-} on the radiolysis of KNO_3 was studied using a Co^{60} γ -source. The samples were prepared by fusing KNO_3 with 0.1-5 mol % of $TlNO_3$, $Sr(NO_3)_2$, and K_2SO_4 at $340^\circ C$. The 0.02-0.07 mm fused nitrate grains were placed in glass ampoules, sealed, and irradiated at $35^\circ-40^\circ C$ at 400 rad/sec. It was found that the Tl^+ additive results in increased radiative yield of potassium nitride, the final product of the potassium nitrate radiolysis. It was also found that up to 10^{19} ev/g doses, the Sr^{2+} and Pb^{2+} additives result in increased potassium nitride yield; doses of greater intensity produced lower potassium nitride yields than those

UDC: 541.15'17

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